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EP 0011584 A1 US 4852751 A

(58) Field of search

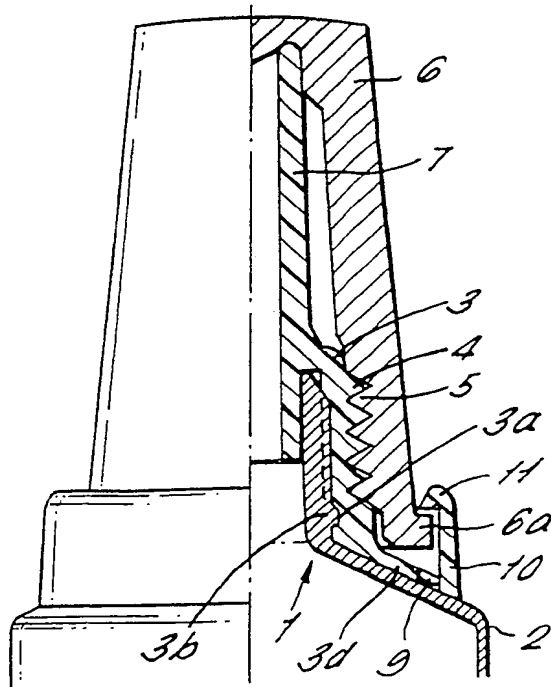
UK CL (Edition L) B8T TBB TTB TTC

INT CL<sup>5</sup> B65D 55/02 55/06 55/08

## (54) Threaded plastic component for tube neck

(57) A plastic threaded component 3 for fixing on the neck of a tube eg by a thread, snapped on or glued on, is provided with a shoulder 3d which projects radially outwards and a tamper-indicating band 10 is fixed to, eg formed integrally with, the shoulder 3d by means of connecting elements, eg tearable bridges 9. The tamper-indicating band 10 engages in a protrusion 6a on a screw cap 6 by means of fastening elements 11 which snap over the protrusion upon initial application of the cap. The connecting elements may extend radially from the shoulder 3d, which fits close and parallel to the tube shoulder, and connect laterally with the inside wall of band 10, or may be formed vertically in the lower part of band 10. The component 3 may possess an extension 7 when used with pharmaceutical products. A membrane may close off the tube and be pierced by a tip formed on the cap (see figs 2 + 5). The component may fit inside and outside the tube opening (fig 4), or cover only a part of the outer surface of the tube neck (fig 6), or partially close off and cover the tube opening (fig 8).

FIG. 1.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

FIG. 1.

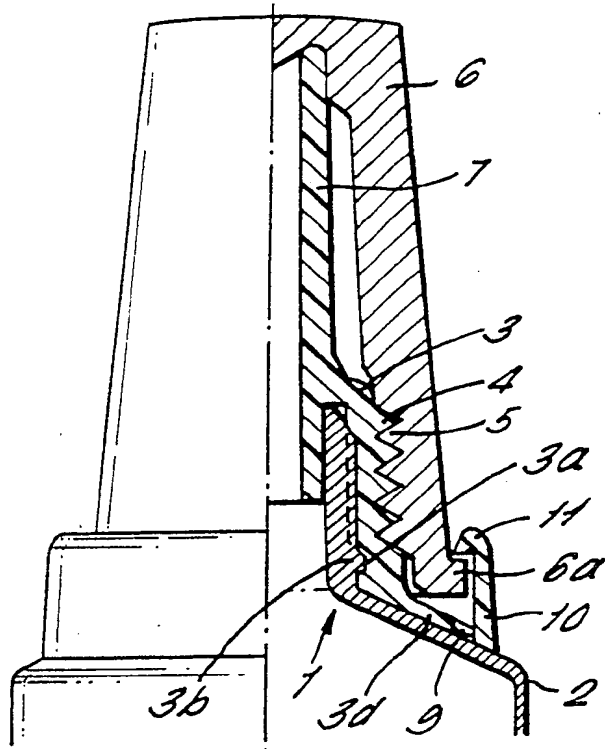
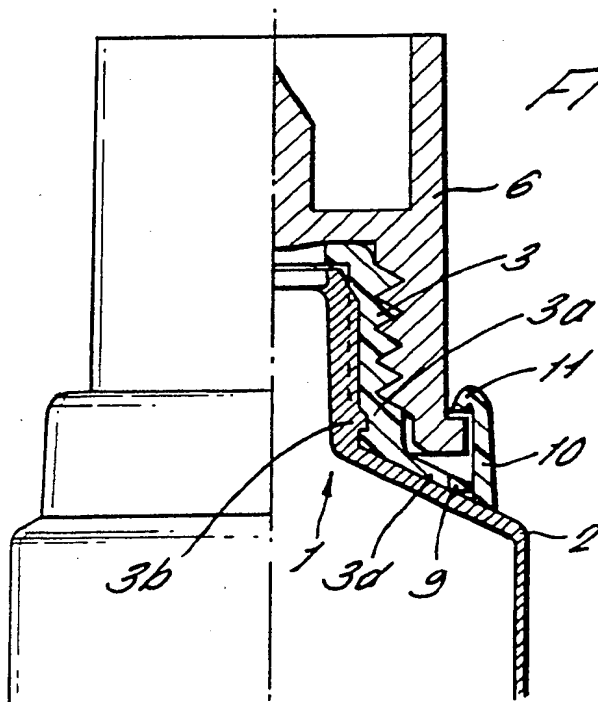


FIG. 2.



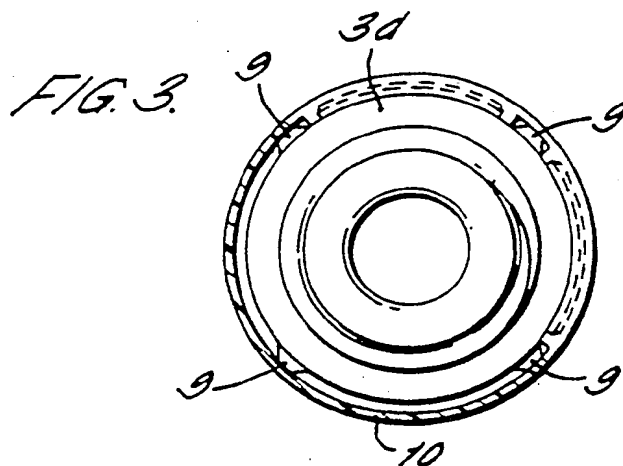


FIG. 4.

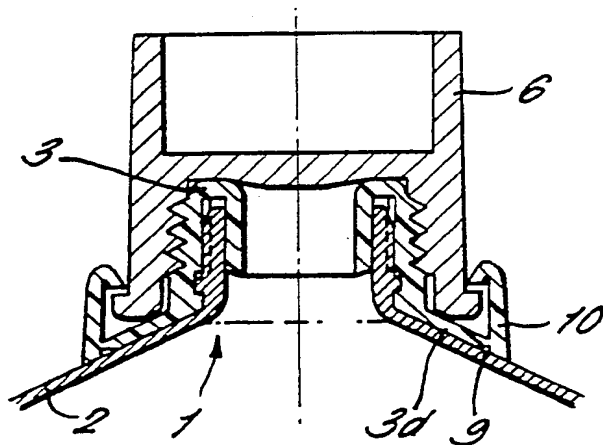


FIG. 5.

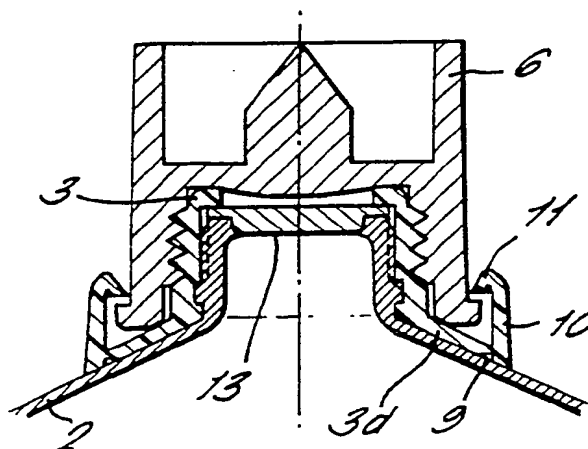


FIG. 6.

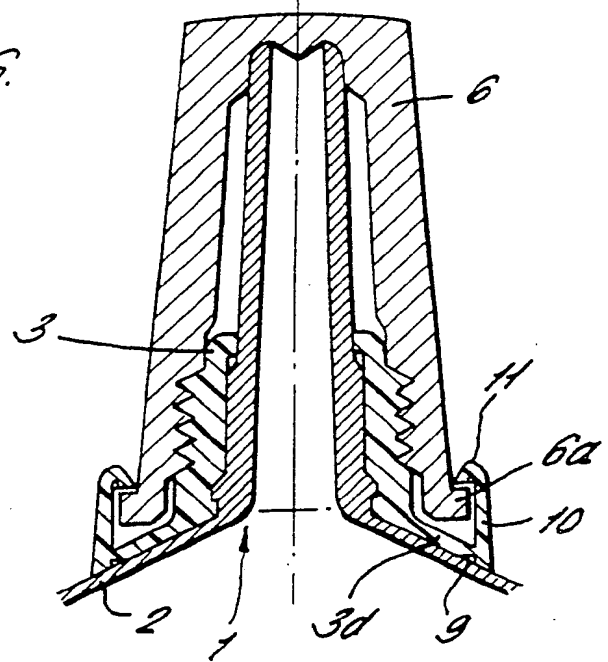


FIG. 7.

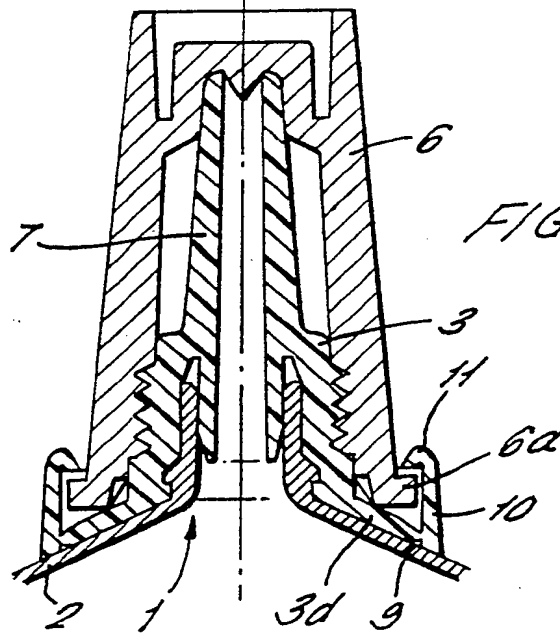
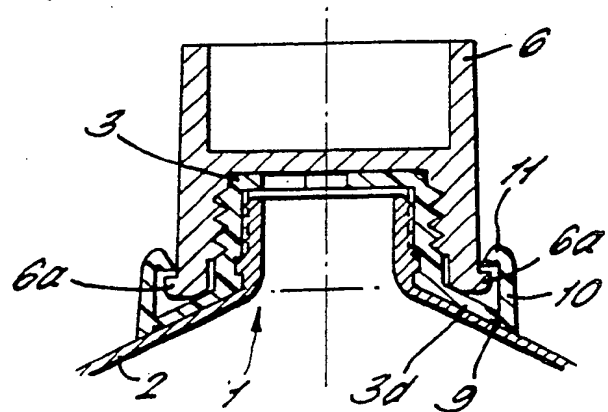


FIG. 8.



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### Threaded Plastic Component for Placement on a Tube Neck.

The invention concerns a threaded plastic component, which is able to be closed by a screw cap, for placement onto a tube neck.

These types of threaded components are known and in use in the most varied embodiments. Such threaded components were originally placed on the existing tube thread, mainly in the case of aluminium tubes, in order to form a plastic thread for the closure cap. Apart from that, such threaded components serve as a protection from aluminium abrasion, as a complete cover for the tube opening, as a way of forming various, including extended, tube openings when employing the same tube shoulder portion etc..

The threaded components are on the one hand connected with the tube neck by screwing onto an existing thread. On the other hand, solutions are known with which the tube itself has no thread and the threaded component is, for example, interlockingly snapped over a threadless projection on the tube shoulder, or is connected with the tube in other ways.

Evidently, this type of threaded component not only provides protection from aluminium abrasion for the material being forced out of the tube, but it also presents the possibility of providing the most varied thread and opening sections, with likewise adapted screw caps, on the same tube body. For this reason, such threaded components are in the meantime not only employed with aluminium tubes, but also with plastic tubes.

In practice, it has been shown that a requirement exists for tubes with a tamper-indicating band. Mainly in the case of multi-component tube constructions with threaded components as described, the arrangement of a tamper-indicating ring, i.e. thus of an additional element, has until now been considered impossible or at least too laborious for mass production.

The invention has the purpose of making possible, in a straight forward embodiment with competitive construction, the construction of such a tube with a separate threaded component possessing an additional tamper-indicating ring.

According to the invention, this purpose is fulfilled in accordance with the characteristics of the patent claims.

With that, the invention provides, in an optimally simple way, for the integral formation of threaded component and tamper-indicating band.

Thus, neither a separate working step nor a separate manufacturing tool is required for the manufacture of the threaded component and the tamper-indicating band. The tamper-indicating band is merely formed integrally with the threaded component, and shaped to conform to it. By appropriate formation of the screw cap, a complementary arrangement can be created without problems in such a way that, when screwing the screw cap onto the threaded component for the first time, the screw cap engages interlockingly with the tamper-indicating band so that opening is no longer possible without the destruction of the tamper-indicating band. The interlocking connection of the tamper-indicating band and the screw cap can be achieved in a particularly simple way if radially inwardly directed fastening elements are provided on the tamper-indicating band and if the screw

cap has at least one bead or protrusion directed radially outwards, over which the fastening elements can engage interlockingly.

The threaded component can be formed in a particularly stable way, and can firmly connect with the tube, if the shoulder of the threaded component runs parallel to the tube shoulder and preferably fits with close contact onto the tube shoulder.

The fixing of the threaded component onto the tube can, with advantage, ensue by means of a thread, but it can also be snapped on, glued on or can be connected either by adherence or interlockingly in another way with the tube neck.

Tearable bridges have particularly proven themselves as connecting elements between the threaded component and tamper-indicating band. These types of bridges can, on the one hand, be so formed that, for mounting, a sufficiently firm connection between threaded component and tamper-indicating band exists, and in addition, that when manufacturing by the injection molding method the tamper-indicating band will be filled via the tearable bridges and that also, when opening for the first time, the bridges will tear and thus display opening.

A particularly advantageous shape will result if the tearable bridges project radially outwards from the outer edge of the shoulder and if the inner diameter of the tamper-indicating band is greater than the outer diameter of the shoulder. Through that, lateral connection of the tearable bridges with the inner wall of the tamper-indicating band is made possible. During opening, an approximately obliquely directed shear force is thus exerted on the tearable bridge, and not only a tensile load, so that rupture of the tearable bridge at the weakend position will be assured. Apart from that, it

will be ensured through the radial arrangement, parallel and fitting closely to the tube shoulder, of the shoulder, the tamper-indicating bridges and the securing ring, that the pressure exerted onto the tamper-indicating band during engagement, when screwing on the screw cap for the first time, will not load the weakened position but will be guided directly onto the tube neck. The shoulder of the threaded component, the tearable bridges and the tamper-indicating band will thus be supported through close fitting on the tube shoulder, through which damage to the tearable bridges during initial closure, i.e. during placement of the closure cap, will be prevented in the simplest way.

Examples and embodiments of the invention are more closely described in the following, illustrated by the drawings.  
Namely:

Figure 1 Schematic representation of a threaded component in partial cross section,

Figure 2 modified embodiment of a threaded component in partial cross section,

Figure 3 plan view of a threaded component seen from above, and

Figure 4  
to 8 various embodiments of threaded components.

According to figures 1 and 2, a threaded component 3 is fixed to the neck portion 1 of a schematically depicted tube 2. The threaded component 3 is a plastic component manufactured by the injection molding method which, by means of a recess 3a, is fixed interlockingly to a protrusion 3b on the neck



portion 1. The threaded component 3 is provided with an outside thread 4 onto which an inside thread 5 of the screw cap 6 engages.

The threaded component 3 possesses an extension 7 to the outlet opening, as is frequently demanded for tubes with pharmaceutical contents.

The screw cap 6 is provided with an outwardly protruding projection 6a at its lower edge. A shoulder 3d is shaped onto the threaded component 3, onto which an annular circumferential tamper-indicating band 10, which runs coaxially to the threaded component 3 and to the screw cap 6, is fixed by means of tearable bridges 9 (Figure 3). The tamper-indicating band 10 possesses a radially inwardly directed, claw shaped fastening element 11 on its upper edge, the inner diameter of which is less than the outer diameter of the projection 6a of the screw cap. During initial screwing on of the screw cap 6, the fastening element, respectively fastening elements 11 are accordingly elastically pressed outwards by the projection 6a so that they snap over the projection 6a. When opening the screw cap 6, the projection 6a accordingly runs up onto the lower edge of the fastening element 11 and carries this with it for such a time until the tearable bridges 9 rupture and release the tamper-indicating band 10. Since the tearable bridges 9 are formed laterally onto the inside diameter of the tamper-indicating band 10, during opening a shear force is exerted onto the tearable bridges 9 so that these will rupture reliably and relatively quickly. As opposed to this, during initial screwing on of the closure cap the tamper-indicating band 10 is pressed downwards by the lower edge of the screw cap 6 and supports itself directly on the neck portion 1 of the tube 2, said tube also supporting the shoulder 3d and the tearable bridges 9.

Through the fact that the tearable bridges 9 protrude radially outwards and run into the inside wall of the tamper-indicating band 10, the threaded component 3 can also be simply formed in an injection molding tool which operates without radially opening jaws and out of which the threaded component 3 is ejected axially. The claw type fastening elements 11 form the only undercutting, which are however elastically deformable during ejection from the mold and can thus yield.

Figure 2 shows an embodiment with a very similar threaded component, which however possesses no extension 7.

With the embodiments according to figures 4 to 8, in each case only the cross section of the threaded component 3 is schematically depicted, without details being shown such as, for example, the arrangement of the tearable bridges 9. With that, the tearable bridges 9 can be formed as with the embodiments according to figures 1 and 2, or can also, for example, be provided vertically in the lower area of the tamper-indicating band 10, without, through that, departing from the framework of the invention.

In the case of the embodiment according to figure 4, the threaded component 3 is folded inwards with a U-shape and accordingly protects both the inside and the outside of the tube opening.

In the case of the embodiment according to figure 5, a membrane 13, which closes off the tube, is provided between the threaded component 3 and the neck portion 1. With initial use, the membrane 13 is penetrated and opened in a known way by means of the tip 14.

In the case of the embodiment according to figure 6, the threaded component 3 is so arranged that only a part of the outer surface of the neck portion 1 is covered.

The embodiment according to figure 7 corresponds to the embodiment according to figure 1.

The embodiment according to figure 8 shows an arrangement with which the threaded component 3 partially closes off and covers the tube opening.

Inasmuch as the invention is subject to modifications and variations, the foregoing description and accompanying drawings should not be regarded as limiting the invention, which is defined by the following claims and various combinations thereof:

## Claims

1. Plastic threaded component which is able to be closed off by a screw cap, for placement on a tube neck, characterized in that the lower edge of the threaded component (3) is radially widened to a shoulder (3d), that a freely projecting tamper-indicating band (10) is fixed to the shoulder (3d) by means of tearable connecting elements (9), and that on the lower edge of the screw cap (6) and on the upper, freely projecting edge of the tamper-indicating band (10) at least a pair of complementary, interlockingly connectable fastening elements (6a, 11) are provided, which interlock in the case of a closed tube in such a way that, when opening the screw cap (6), the tamper-indicating band (10) is able to be separated from the connecting elements (9).
2. Threaded component according to claim 1, characterized in that radially inwardly directed fastening elements (11) are provided on the tamper-indicating band (10) and at least one radially outwardly directed bead or projection (6a) is provided on the lower edge of the screw cap.
3. Threaded component according to one of the preceding claims, characterized in that the shoulder (3d) of the threaded component runs approximately parallel to the shoulder of the neck portion (1) of the tube (2).
4. Threaded component according to claim 3, characterized in that the shoulder (3d) fits

closely, respectively supports itself on the tube shoulder.

5. Threaded component according to one of the preceding claims, characterized in that the threaded component (3) is fixed to the neck portion (1) of the tube (2) by adherence or interlockingly.
6. Threaded component according to claim 5, characterized in that it is fastened to the tube thread by means of an inside thread.
7. Threaded component according to one of the preceding claims, characterized in that tearable bridges (9) are provided as connecting elements.
8. Threaded component according to one of the preceding claims, characterized in that the tearable bridges (9) project radially outwards from the outer edge of the shoulder (3d), and that the inner diameter of the tamper-indicating band (10) is greater than the outer diameter of the shoulder (3d).
9. Threaded component according to claim 8, characterized in that the tearable bridges (9) are connected laterally with the inside wall of the tamper-indicating band (19).
10. Plastic threaded component substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

Patents Act 1977

Examiner's report to the Comptroller under  
Section 17 (The Search Report)

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Relevant Technical fields

(i) UK CI (Edition 1) B8T TBB, TTB, TTC

(ii) Int CI (Edition 5) B65D 55/02, 55/06, 55/08

Search Examiner

KARL WHITFIELD

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

23 FEBRUARY 1993

Documents considered relevant following a search in respect of claims

1-9

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
Y	EP 0011584 A1 (ASTRA-PLASTIQUE) whole document relevant.	1-9
Y	US 4852751 (SUNBEAM) see especially Figure 5	1-9

SF2(p)

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Category	Identity of document and relevant passages	Relevant to claim(s)

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